Rainwater Harvesting

An Underutilized Conservation Project

Rainwater harvesting, a water collection practice used throughout the world for over 4,000 years, gives consumers access to an additional water source on their property. The collected rainwater is often used for landscape irrigation, but, with proper treatment, it can be used for drinking water.

Most people do not take advantage of this sensible opportunity. While rainwater-harvesting systems do involve costs, in the long run, they have the potential to conserve both money and water.

There are two general approaches to harvesting rainwater: a simple system and a complex system.

Simple System:

In a simple rainwater harvesting system, runoff from rainfall is collected and used on-site. Distribution systems channel the captured rainwater to holding areas.

The roof of a building or home is one commonly used catchment. The bigger the roof, the larger the volume of water collected. Gravity then naturally directs the water to collection vessels at the edge of the roof which store it for direct landscape use.

Roofing made from iron, aluminum, or cement is preferable because it absorbs little or no water.

Complex System:

A complex rainwater harvesting system also includes catchments, but the water is directed by a conveyance system to closed storage containers. Roof catchment systems use canals or gutters and downspouts as conveyance systems.

Filtration removes debris from the water before it is stored. The amount of filtration needed depends on the size of the distribution tubing and emission devices. Larger tubing requires more filtration due to increased debris amounts. In-line filters and leaf screens are effective filtration methods.

Storage containers can be under or above ground. Underground containers, while having the advantage of gravity's natural pull, are more expensive.

When it is time to use the water, the distribution system uses garden hoses, constructed channels,

pipes, or drip systems (with or without pumps) to direct water from the storage containers to landscape plants or other outdoor or in-home uses.

Why install a rainwater harvesting system?

Texas is particularly suitable for rainwater harvesting because of its unique rainfall pattern. Peak rainfall occurs in April and May, followed by a dry period from June to August, with more rain from September to October. Using an adequate rainwater harvesting system, Texans can easily get through the dry periods of the year without the need for additional water.

Each year, irrigation accounts for 30 percent to 50 percent of Texas urban water use, averaging 20 gallons of water per square foot per year (871,200 gallons per acre). Using a rainwater harvesting system, a 1,000 square foot roof area can collect 600 gallons of water from only an inch of rain. Clearly, harvested rainwater can help reduce the demands on surface and groundwater for urban landscape irrigation, save municipal water supplies, and lower homeowner water bills.

Rainwater quality is another benefit when compared to treated water sources. For example, naturally occurring rainwater is sodium-free, which can force salts away from the root zone, an important consideration in areas with waters with moderate to high salinity.

“Sodium-free rainwater can also prevent the buildup of sodium in the soil profile,” said Dr. Monty Dozier, Texas A&M University water resources Extension specialist. “Use of irrigation water with moderate to high sodium content can impact soil quality and interfere with plants' water uptake.”

Plants respond much better to natural rainwater because it lacks the chemicals that are added to processed water, and its natural softness makes it better for household uses. Because of its low salinity, purified rainwater is also much healthier for those on a low-sodium diet.

Rainwater harvesting can also reduce flooding, erosion, and contamination of surface water by better controlling hydrologic processes on an individual piece of property.

The cost of implementing a home rainwater harvesting system ranges from $5,000 to $8,000. Many Texas cities have offered rebates and tax exemptions for those willing to install them.

In 2001, Senate Bill 2 was passed to exempt tax on items purchased for rainwater harvesting. The City of Austin offers a rebate of half the cost of a system installation to industrial, commercial, and institutional customers at existing facilities—a value of up to $40,000. Hays County provides a property tax and application fee rebate for those with rainwater harvesting systems.

These incentives are definitely encouraging people to build rainwater harvesting systems. The number of people with harvesting systems increases every year, but there is still more room for growth. Rural landowners and homeowners may find use of a complete rainwater harvesting system an attractive alternative to the expense of drilling and maintaining a private water well. In fact, in some areas of Texas, groundwater may not be available, making rainwater harvesting the only viable way to secure a water supply.

Rainwater harvesting systems are a practical alternative for Texans, especially related to water costs and conservation. If you are interested in learning more about rainwater harvesting, download or purchase a copy of the latest Texas Cooperative Extension publication B-6153 available at http://tcebookstore.org/.